Astronomy

4-3 The student will demonstrate an understanding of the properties, movements, and locations of objects in the solar system. (Earth Science)

4.3.4 Explain how the tilt of Earth's axis and the revolution around the Sun results in the seasons of the year.
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: In kindergarten (K-4) students demonstrated an understanding of seasonal weather changes. In 2nd grade (2-3.3), students illustrated the weather conditions of different seasons. In 8th grade (8-4.5), students will study the cause for the seasons including the amount of heating of Earth due to the angle of the Sun's rays and the affect of daylight hours.

It is essential for students to know that Earth has distinct seasons which result from the tilt of its axis and its revolution around the Sun.

- Earth revolves around the Sun one time each year in about 365 days.
- Earth has seasons because Earth's axis is tilted.
- Because of the tilt, the number of daylight hours changes throughout the year.
- As Earth revolves around the Sun, different parts of Earth get more sunlight.
- The tilt also causes the northern or the southern part of Earth, to point toward the Sun.
- When the tilt is toward the Sun, the season is summer; when the tilt is away from the Sun, the season is winter.
- The two hemispheres have opposite seasons.
- The seasons do NOT depend on the distance of Earth from the Sun.

Axis

- Earth rotates around an imaginary straight line called an axis that runs through the planet's center.

Revolution

- The movement of Earth as it makes an orbit around the Sun in one year.

Seasons

- The effects on Earth due to the change in the amount of sunlight caused by the tilt of Earth's axis.
  - Summer occurs when part of Earth is tilted most toward the Sun
  - Autumn and spring occur when neither part of Earth is pointed directly toward or away from the Sun.
  - Winter occurs when part of Earth is tilted away from the Sun.
  - The sequence of the seasons during the year is summer, autumn/fall, winter, and then spring.

It is not essential for students to know about the angle of the Sun's rays.

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Assessment Guidelines:

The objective of this indicator is to *explain* how the tilt of Earth's axis and the revolution around the Sun results in the seasons of the year; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the ways that Earth's seasons are affected by these two factors. However, appropriate assessments should also require students to *recall* information about Earth's axis or revolution; *classify* by sequencing the seasons; or *infer* or *illustrate* a season based on the description or drawing of the tilt of the axis.